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FEDERAL COMMUNICATIONS COMMISSION
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September 25, 2000

CLIENT NO. 45893-81156

By Hand

Magalie Roman Salas
Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, D.C. 20554

Re: Petition for Rulemaking of KEZI, Inc.

Dear Ms. Salas:

Transmitted herewith on behalf of our client, KEZI, Inc., is an original, and four (4) copies, of a Petition for Rulemaking seeking to amend the DTV Table of Allotments in Section 73.622(b) to substitute Channel D44 for Channel D14 for Station KEZI-DT at Eugene, Oregon

Should any questions arise in connection with this matter, kindly communicate directly with this office.

Very truly yours,

Howard J. Braun
Laura A. Otis

Enclosures (5)

No. of Copies rec'd 0+4
List A B C D E

51017678.01

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Section 73.622(b),	)	RM –
Table of Allotments	)	MM Docket No. -
Digital Television Broadcast Stations	)	
(Eugene, Oregon)	)	

To: Chief, Video Services Division
Mass Media Bureau

PETITION FOR RULEMAKING

KEZI, Inc. ("KEZI"), licensee of television station KEZI-DT, NTSC Channel 9, Eugene, Oregon, by its attorneys and pursuant to Section 73.622(a) of the Commission's Rules, hereby petitions the Commission to initiate a rulemaking to amend the digital television ("DTV") Table of Allotments in Section 73.622(b) of the Rules to substitute Channel D44 for Channel D14 at Eugene, Oregon.

As demonstrated in the attached Engineering Statement prepared by Dane E. Ericksen, the requested change to the DTV Table of Allotments can be made in full conformance with the FCC's technical rules, and will:

(1) Enable KEZI to operate more efficiently and provide improved DTV service within its market;

(2) Eliminate potential interference to land mobile radio stations operating in the 450-470 MHz band;

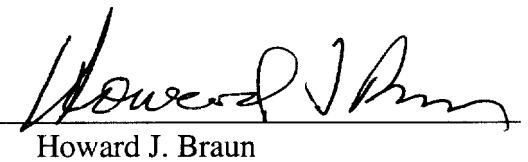
Further, as demonstrated in the Engineering Statement, the benefits of the proposed substitution can be achieved without creating interference problems to other DTV or NTSC stations, and without affecting the service of Class A, low power, or TV translator stations.

In sum, substituting Channel D44 for Channel D14 at Eugene, Oregon would represent an ideal DTV allotment that would promote the Commission's goals of providing "broadcasters with the best possible spectrum for DTV operation"[1] and ensuring that the spectrum "will be used in a manner that best serves the public interest."[2] Grant of this petition would also show that the Commission is indeed committed to devising rules which "strengthen, not hamper, the possibilities for broadcast DTV's success."[3]

KEZI accordingly requests that the Commission initiate a rulemaking proceeding to amend the DTV Table of Allotments in Section 73.622(b) of the FCC's Rules by substituting Channel D44 for Channel D14 at Eugene, Oregon.

Respectfully submitted,

KEZI, Inc.

By: 

Howard J. Braun
Laura A. Otis

ROSENMAN & COLIN LLP
805 15th Street, N.W., 9th Floor
Washington, D.C. 20005
202-216-4600
Its Attorneys

September 25, 2000

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1 *In re* Advanced Television Systems, *Sixth Report and Order,* 12 FCC Rcd 14588, 14627 (rel. April 21, 1997).

2 *In re* Advanced Television Systems, *Fifth Report and Order,* 12 FCC Rcd 12809, 12811 (rel. April 21, 1997).

3 Id.

Station KEZI-DT
as DTV Channel 44
Eugene, Oregon

Engineering Exhibit
in Support of Petition for Rulemaking
to Change Frequency from
Channel D14 to Channel D44

September 11, 2000

HAMMETT & EDISON, INC.
CONSULTING ENGINEERS
SAN FRANCISCO

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by KEZI, Inc. ("KEZI"), licensee of TV Station KEZI, NTSC Channel 9, Eugene, Oregon, to prepare an engineering exhibit in support of a Petition for Rule Making to amend the DTV Table of Allotments to substitute Channel D44 for Channel D14 for Station KEZI-DT.

Background Information

In the Sixth Order on Reconsideration to MM Docket 97-268, KEZI-DT was assigned Channel D14 with an effective radiated power ("ERP") of 548 kW at an effective height of 539 meters. However, there are multiple disadvantages to such a band-edge channel, and KEZI would accordingly prefer a non-band-edge, but still in-core, DTV channel. There are numerous reasons for avoiding a band-edge Channel D14 allocation, as follows:

- Brute-force overload ("BFO") to 450–470 MHz land mobile radio service ("LMRS") stations caused by the in-band portion of the KEZI-DT as Channel D44 signal would no longer exist.
- A "heroic" lower sideband filter, with even tighter suppression than the -110 dBc mask required for DTV stations, would not be necessary. This, in turn, means that the group delay distortions inherent in a sharply tuned filter would not occur, and the threat of uncorrectable group delay distortion to the KEZI-DT digital signal would be eliminated.
- Existing LMRS service licensees in the 450–470 MHz band, and especially those between 467–470 MHz, would no longer have an incompatible, high-power DTV signal at 470–476 MHz.
- The special condition placed on other Channel D14 construction permits,* requiring the station to "take adequate measures to identify and substantially eliminate objectionable interference which may be caused to existing land mobile radio facilities in the 460 to 470 MHz band" would become unnecessary.
- KEZI-DT as Channel D44 would not be at risk of expensive-to-solve (and possibly impossible-to-solve) interference problems, nor at risk of only being granted Program Test Authority for less than full-power operation because of unresolved interference complaints from LMRS licensees.

* For example, Station KERA-DT, Channel D14, at Dallas, Texas (FCC File Number BPEDT-980604KE).

A channel search has been done, and it has been determined that Channel D44 could be substituted for Channel D14 in compliance with all FCC rules and policies.

No Interference To Any NTSC or DTV Allocation, Application, Permit, or License

As shown by the attached OET-69 interference study, Figure 1, KEZI-DT as Channel D44 at the allotted location and ERP would not cause interference to any other TV station if a directional "cardioid" pattern antenna that suppresses radiation toward the Portland, Oregon, market, is used. The proposed azimuth pattern is shown in the attached Figure 2. Due to tower space considerations, a somewhat lower center-of-radiation height of 742.5 meters AMSL rather than the KEZI(TV), NTSC Channel 9 center-of-radiation height of 780 meters AMSL would be employed. Further, and as shown by the attached OET-69 coverage study, Figure 3, KEZI-DT as Channel D44 would not receive significant interference from any other NTSC station, or from any other DTV allotment, application, permit, or license. Finally, and also as shown by the attached Figure 3, the proposed KEZI-DT as Channel D44 F(50,90) 41.5 dBu DTV threshold contour would continue to completely encompass Eugene, Oregon.

It is, therefore, proposed that the DTV Table of Allotments be amended to substitute Channel D44 for Channel D14 at Eugene, Oregon.

No Impact to Class A, LPTV, or TV Translator Stations

KEZI-DT as D44 would not impact any TV translator, LPTV, or potential Class A TV stations. Specifically, potential Class A TV Stations K29AZ at Roseburg, Oregon, K43DI at Canyonville, Oregon, and K67FV as N44 at Coos Bay, Oregon, all show zero interference from KEZI-DT as D44 when studied using OET-69 methodologies.

No Canadian or Mexican Impacts

The proposed KEZI-DT site is 458 kilometers from the U.S.-Canada border and is 1,385 kilometers from U.S.-Mexico border. Since this is more than 400 kilometers from the Canadian border, and is more than 275 kilometers from the Mexican border, no concurrence by the Canadian or Mexican governments will be required.

Summary

The DTV Table of Allotments can be modified to substitute DTV Channel D44 for DTV Channel D14 at Eugene, Oregon, without causing interference to any other NTSC or DTV allocation, application, or station. No TV translator, LPTV, or potential Class A TV stations would be impacted. The proposed KEZI-DT as Channel D44 facilities would continue to completely cover Eugene. Finally, the proposed channel substitution would eliminate a potentially serious interference problem to LMRS stations operating in the 450–470 MHz band.

List of Figures

In carrying out these engineering studies, the following attached figures were prepared under my direct supervision:

1. OET-69 interference study of KEZI-DT as Channel D44
2. Proposed directional antenna pattern
3. OET-69 coverage study for KEZI-DT as Channel D44.

Dane E. Ericksen, P.E.

September 11, 2000

REGISTERED PROFESSIONAL ENGINEER
DANE E. ERICKSEN
No. 11654
Exp. 9-30-04
ELECTRICAL
STATE OF CALIFORNIA

Affidavit

State of California | ss:
County of Sonoma |

Dane E. Ericksen, being first duly sworn upon oath, deposes and says:

1. That he is a qualified Registered Professional Engineer, holds California Registration No. E-11654, which expires on September 30, 2004, and is employed by the firm of Hammett & Edison, Inc., Consulting Engineers, with offices located near the city of San Francisco, California,

2. That he graduated from California State University, Chico, in 1970, with a Bachelor of Science Degree in Electrical Engineering, was an employee of the Field Operations Bureau of the Federal Communications Commission from 1970 to 1982, with specialization in the areas of FM and television broadcast stations and cable television systems, and has been associated with the firm of Hammett & Edison, Inc., since October 1982,

3. That the firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by KEZI, Inc. ("KEZI"), licensee of TV Station KEZI, NTSC Channel 9, Eugene, Oregon, to prepare an engineering exhibit in support of a Petition for Rule Making to amend the DTV Table of Allotments to substitute Channel D44 for Channel D14 for Station KEZI-DT,

4. That such engineering work has been carried out by him or under his direction and that the results thereof are attached hereto and form a part of this affidavit, and

5. That the foregoing statement and the report regarding the aforementioned engineering work are true and correct of his own knowledge except such statements made therein on information and belief and, as to such statements, he believes them to be true.

Dane E. Ericksen, P.E.

Subscribed and sworn to before me this 11th day of September, 2000

AMY L. MILLER
Commission # 1197811
Notary Public - California
Sonoma County
My Comm. Expires Oct 4, 2002

Station KEZI-DT • as Channel D44 • Eugene, Oregon

OET-69 Interference Study for KEZI-DT as Channel D44
548 kW (DA) ERP Dielectric C170 at 190°T
C.O.R. = 742.5 m AMSL

Interference analysis
tvixstudy 2.3.7

Study cell size 1.0 km
Terrain profile resolution 10.0 pts/km

Before case parameters:
(same as "Original" below)

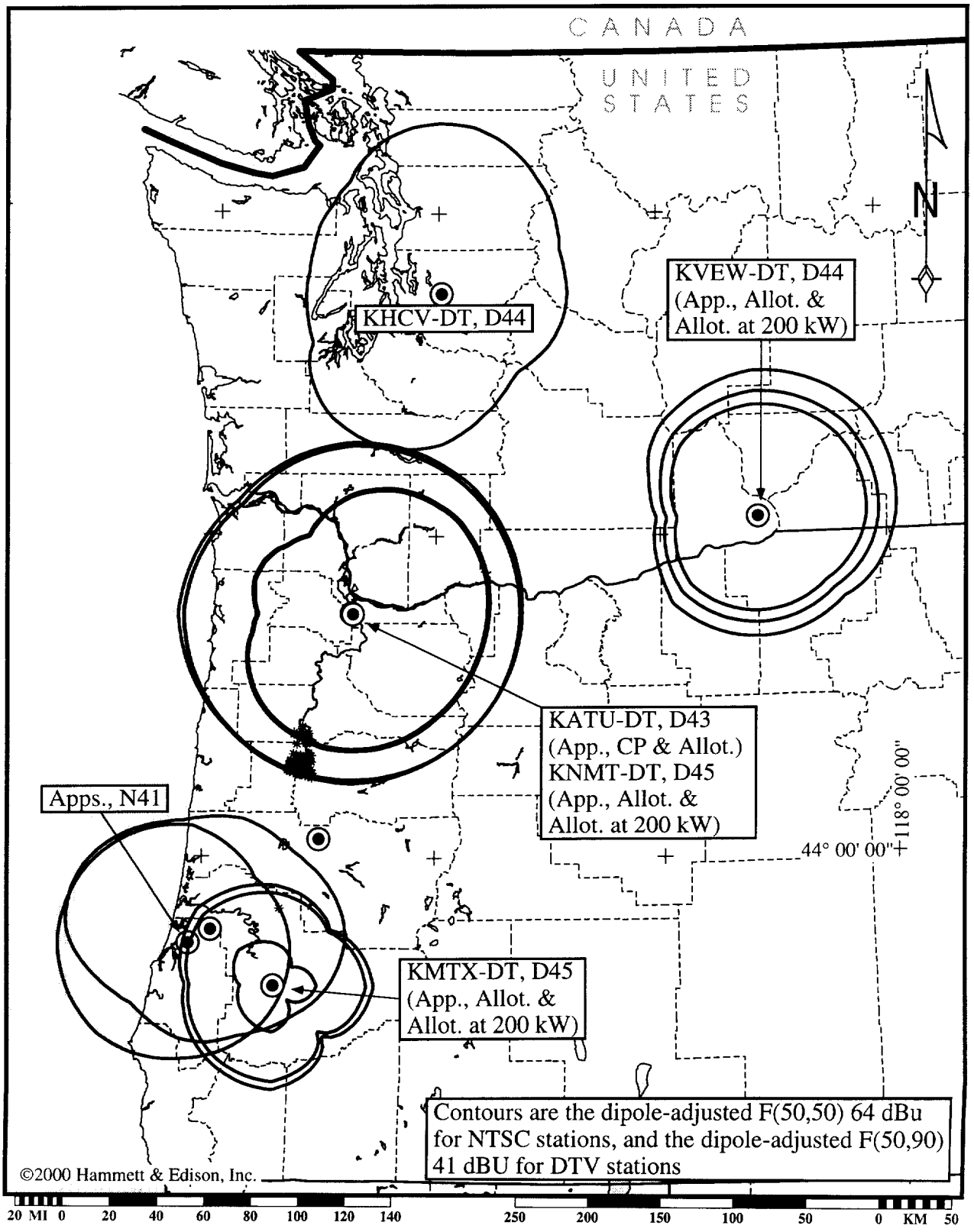
After case parameters:

	--Modified--	--Original--
Station:	D44 KEZIDT allot	D14 KEZIDT allot
City:	EUGENE, OR	EUGENE, OR
Coordinates:	N 44-06-57.0	N 44-06-57.0
	W 122-59-57.0	W 122-59-57.0
Height AMSL:	742.5 m	780.0 m
Maximum ERP:	548 kW	548 kW
Azimuth pattern:	C170az.pat	DTV1194 (replication)
Orientation:	190.0	0.0
Elevation pattern:	OET-69 generic	OET-69 generic
Service level:	41.5 dBu	38.7 dBu

		Before			After		
	BasePop	IX Change			IX Change		
Protected station	1000s	1000s	%Base		1000s	%Base	%Chng
N41 970730KU APP COOS BAY, OR	97	0	0.0		0	0.0	0.0
N41 970805KN APP COOS BAY, OR	121	0	0.0		0	0.0	0.0
D43 KATU-DT APP PORTLAND, OR	2,000	16	0.8		41	2.0	1.2
D43 KATUDT allot PORTLAND, OR	2,000	14	0.7		42	2.1	1.4
ERP = 1000 kW							
D44 KVEW-DT APP KENNEWICK, WA	250	-12	-4.8		-12	-4.8	0.0
D44 KVEWDT allot KENNEWICK, WA	250	-1	-0.4		-1	-0.4	0.0
ERP = 50.0 kW							
D44 KVEWDT allot KENNEWICK, WA	250	-49	-19.6		-49	-19.6	0.0
ERP = 200 kW							
D45 KMTX-DT APP ROSEBURG, OR	65	-14	-21.5		-14	-21.5	0.0
D45 KMTXDT allot ROSEBURG, OR	65	0	0.0		0	0.0	0.0
ERP = 50.0 kW							
D45 KMTXDT allot ROSEBURG, OR	65	-18	-27.7		-18	-27.7	0.0
ERP = 200 kW							
D44 KHCV-DT APP SEATTLE, WA	1,885	-1,149	-61.0		-1,149	-61.0	0.0
D45 KNMT-DT APP PORTLAND, OR	1,762	-219	-12.4		-201	-11.4	1.0
D45 KNMTDT allot PORTLAND, OR	1,762	53	3.0		53	3.0	0.0
ERP = 161 kW							
D45 KNMTDT allot PORTLAND, OR	1,762	29	1.6		29	1.6	0.0
ERP = 200 kW							

Station KEZI-DT • as Channel D44 • Eugene, Oregon

OET-69 Allocation Conditions for KEZI-DT as Channel D44



Map data taken from Sectional Aeronautical Charts, published by the National Ocean Survey. Geographic coordinate marks shown at 120-minute increments.

HAMMETT & EDISON, INC.
CONSULTING ENGINEERS
SAN FRANCISCO

000907
Figure 1B

TVIXSTUDY™ Analysis Methodology

Implementation of FCC's Interference-Based Allocation Algorithm

On April 21, 1997, the Federal Communications Commission released its Fifth and Sixth Report and Order texts to Mass Media Docket No. 87-268, establishing a final Table of Allotments for the transition from analog NTSC television service to a digital television ("DTV") service. The Commission utilized a complex set of computerized analysis tools to generate the DTV allotment table and added FCC Rules Section 73.623(b)(2), requiring that similar tools be employed to analyze individual DTV station assignments with regard to their potential interference to other DTV stations, DTV allotments, and existing or authorized NTSC facilities. Those tools were described in FCC OET Bulletin No. 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference* ("OET-69"), released on July 2, 1997. Subsequent to OET-69, the Commission released, on February 23, 1998, its Memorandum Opinion and Order on Reconsideration of the Fifth [and Sixth] Report and Order[s], which made a number of changes to the previous allotment table and modified several of the analysis methods to be employed for studying DTV allotments and potential facility modifications. On August 10, 1998, the Commission published a text, *Additional Application Processing Guidelines for Digital Television (DTV)*, which provided important clarifications and enhancements to the specified analysis methods. Hammett & Edison has developed and refined the TVIXSTUDY computer software to perform FCC-style DTV allocation studies as based on OET-69, its subsequent clarifications, and also upon a detailed examination of the FCC allotment program software source code.

For most NTSC or DTV stations to be studied, the FCC analysis model first determines the location of the conventional F(50,50) Grade B contour of the NTSC station, or of the NTSC station associated with an assigned DTV station, using pattern information contained in the FCC engineering database and an assumed antenna elevation pattern. The model assumes that contour as an envelope, outside of which no protection from interference is implied or afforded. The location of the Grade B contour was used to determine the assigned power for the DTV station, once again using conventional methods found in FCC Rules Section 73.699, Figures 9 and 10, determining the power necessary on a radial basis to generate the associated DTV coverage contour (41 dBu for UHF, 36 dBu for high VHF Channels 7–13, and 28 dBu for low VHF Channels 2–6), for an assigned DTV channel. The maximum power determined using this method was assigned as the DTV operating power, provided it was calculated to be above established minimum power levels; otherwise, a minimum power level was assigned. By the same token, facilities with calculated DTV power levels above the established maximum power levels for a given channel were assigned the maximum power level. The use of this method usually creates a directional DTV antenna replication pattern, even for DTV assignments to presently omnidirectional NTSC TV stations. The FCC requires that a DTV facility employ an antenna design that meets the calculated replication envelope parameters, unless, with a few exceptions, zero or *de minimus* new interference to other facilities can be demonstrated.

In addition to the use of the Grade B envelope and an assumed directional transmitting antenna for all DTV facilities, the model assumes the use of directive receiving antennas at each studied location, or "cell." The characteristics of the receiving antennas are different, not only for the low

VHF, high VHF, and UHF frequency bands, but also for NTSC and DTV receiving situations; the FCC model specifies that more directive antennas be employed for analysis of DTV reception.

The FCC analysis technique employs terrain-sensitive calculation methods based on Version 1.2.2 of the ITS Irregular Terrain Model, also known as the Longley-Rice model. For each NTSC or DTV station to be studied, a grid of cells, two kilometers on a side, fills the associated Grade B or noise-limited contour. The program first determines which of the cells is predicted to receive service from the associated station, using Longley-Rice analysis with F(50,50) statistical weighting for NTSC and F(50,90) statistical weighting for DTV stations. Cells determined to have no service are not studied for interference from other stations.* Once cells having service are determined, the software analyzes potential interference from other NTSC or DTV stations, again using the Longley-Rice propagation algorithm and defined statistical weighting for all potential interfering signals. Each cell is evaluated, as appropriate, using the desired-to-undesired ratios and methods presented in FCC Rules Section 73.622, 73.623, and 74.706 for each channel relationship, and cells determined to have interference are flagged and excluded from further study, resulting in the generation of net interference-free coverage population totals.

The TVIXSTUDY analysis program employs all of the OET-69 analysis features described above, as well as several other more subtle elements prescribed by the FCC. Additionally, the program allows modeling of implementation scenarios that involve changes to effective radiated power, antenna height, antenna pattern, channel number, and/or transmitter location. TVIXSTUDY also can identify cells that fall in major bodies of water, as based on digitized map data, excluding them from the study. The program is primarily intended to study the effects of existing/potential NTSC or DTV facilities on other DTV or NTSC facilities, as based on desired-to-undesired ratio parameters defined in OET-69. A typical TVIXSTUDY analysis summary includes technical parameters of the proposed DTV or NTSC facility, along with its original (pre-modification) technical parameters, if any. Also included is a listing of each protected DTV and/or NTSC facility or allotment with associated interference-free population tabulations and the unique interference population resulting from operation of the proposed facility. TVIXSTUDY is similar to the program TVCOVSTUDY, which instead predicts the interference-limited coverage of a selected facility.

The results of the OET-69 algorithm are dependent on the use of computer databases, including terrain, population, and FCC engineering records. FCC Rules §0.434(e) specifically disclaims the accuracy of its databases, recommending the use of primary data sources (*i.e.*, paper documents), which is not practical for DTV interference analyses. Further, while Hammett & Edison, Inc. endeavors to follow official releases and established precedents on the matter, FCC policy on DTV analysis methods is constantly changing. Thus, the results of OET-69 interference and coverage studies are subject to change and may differ from FCC results.

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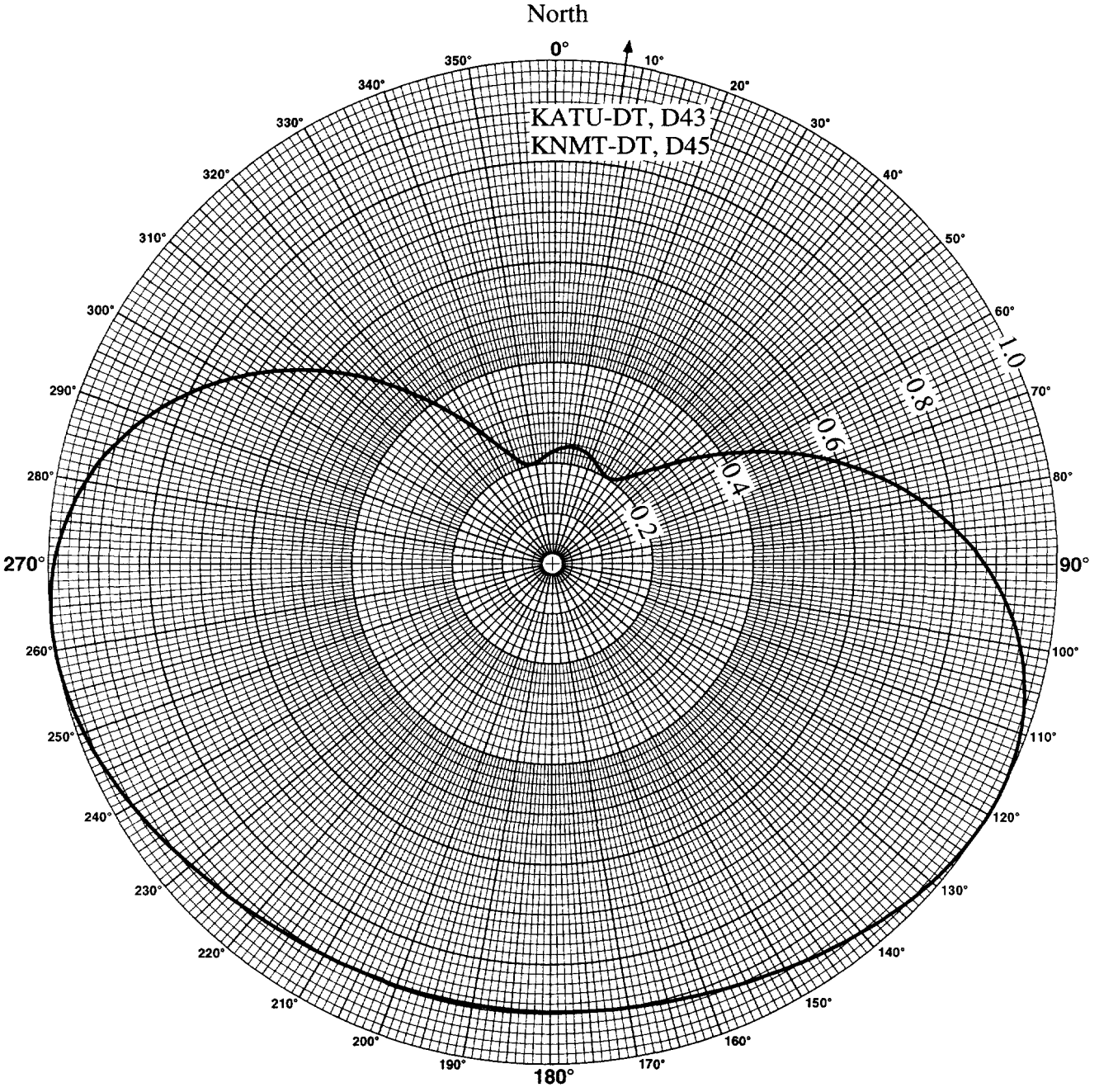
* It is noted that the Longley-Rice model is not always capable of determining, within certain confidence limits, whether a particular cell has service. In such cases, the Longley-Rice algorithm returns an error code; the FCC method for handling such error codes is to assume that the associated cells have interference-free service and, as such, are not further considered. The Hammett & Edison TVIXSTUDY program reports the number of such error cells for a given study and provides the option of generating a map showing their locations, which may be useful for further review using other propagation analysis tools.

Station KEZI-DT • as Channel D44 • Eugene, Oregon

Proposed Antenna Pattern
Dielectric C170 Azimuth Pattern at 190°T
- Relative Field -



Station KEZI-DT • as Channel D44 • Eugene, Oregon

Dielectric C170 Azimuth Pattern at 190°T
Relative Field Tabulation

Azimuth	Relative Field
0°T	0.223
10	0.234
20	0.223
30	0.203
40	0.222
50	0.310
60	0.444
70	0.595
80	0.738
90	0.857
100	0.941
110	0.988
120	1.000
130	0.987
140	0.961
150	0.934
160	0.913
170	0.901
180	0.896
190	0.894
200	0.896
210	0.901
220	0.913
230	0.934
240	0.961
250	0.987
260	1.000
270	0.988
280	0.941
290	0.857
300	0.738
310	0.595
320	0.444
330	0.310
340	0.222
350	0.203

Station KEZI-DT • as Channel D44 • Eugene, Oregon

OET-69 Coverage Study for KEZI-DT as Channel D44
548 kW (DA) ERP Dielectric C170 Pattern at 190°T
C.O.R. = 742.5 m AMSL

Coverage analysis
tvcovstudy 2.3.7

Study cell size 1.0 km
Terrain profile resolution 10.0 pts/km

Station parameters:

	--Modified--	--Original--
Station:	D44 KEZIDT allot	D14 KEZIDT allot
City:	EUGENE, OR	EUGENE, OR
Coordinates:	N 44-06-57.0	N 44-06-57.0
	W 122-59-57.0	W 122-59-57.0
Height AMSL:	742.5 m	780.0 m
Maximum ERP:	548 kW	548 kW
Azimuth pattern:	C170az.pat	DTV1194 (replication)
Orientation:	190.0	0.0
Elevation pattern:	OET-69 generic	OET-69 generic
Service level:	41.5 dBu	38.7 dBu

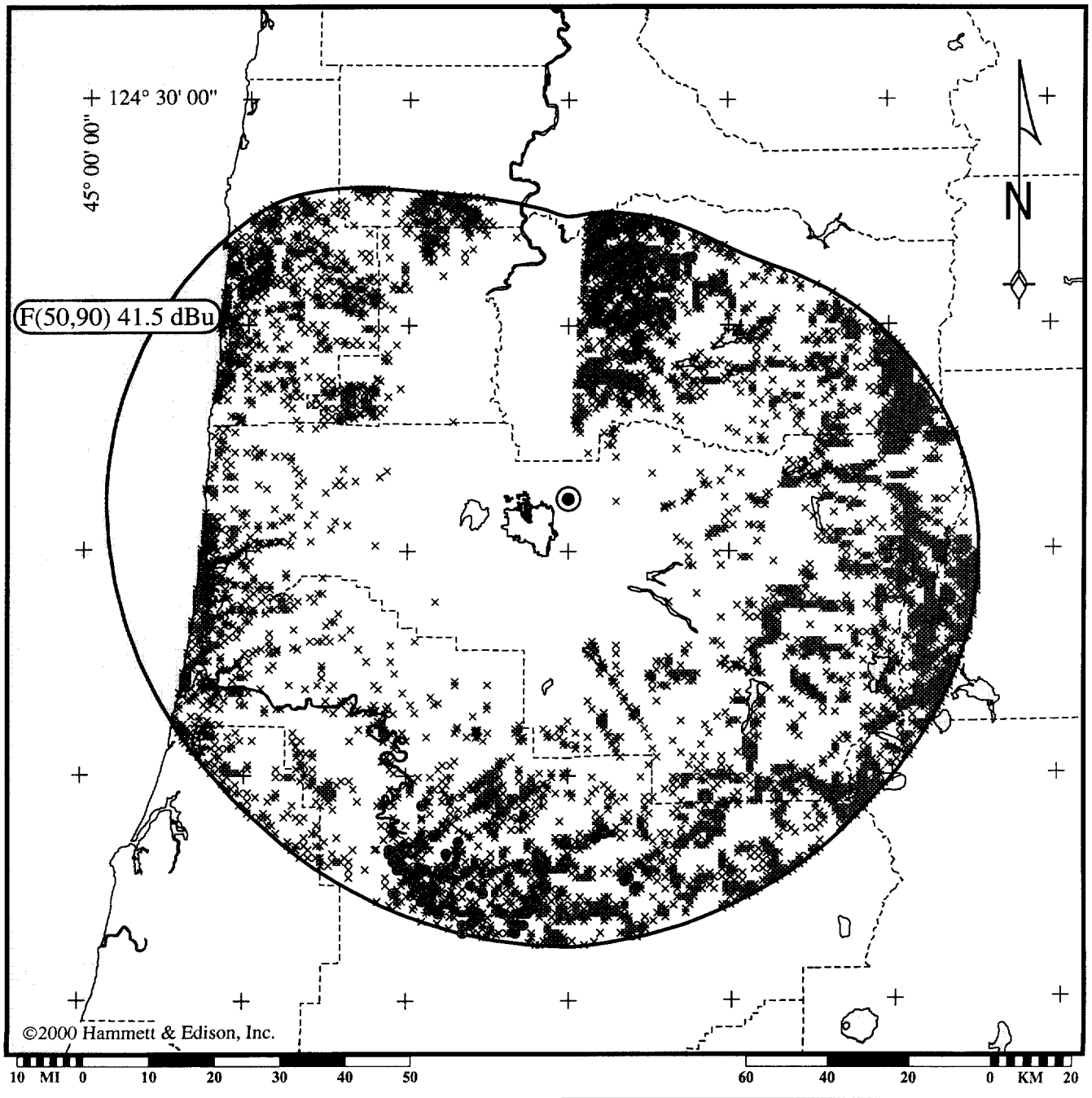
		Total IX		Unique IX	
Interfering station		Area,km2	Population	Area,km2	Population
D43 KATUDT allot	PORTLAND, OR	2.0	0	0.0	0
D44 KVEWDT allot	KENNEWICK, WA	0.0	0	0.0	0
D45 KMTXDT allot	ROSEBURG, OR	59.3	1,508	59.3	1,508
D45 KNMTDT allot	PORTLAND, OR	2.0	0	0.0	0

Service conditions	Area,km2	Population
Noise-limited service	29403.2	534,472
Terrain-limited service	23872.1	451,023
Interference-free service	23810.8	449,515
Longley-Rice errors	18450.7	145,879

Note:
The results of the OET-69 algorithm are dependent on the use of computer databases, including terrain, population, and FCC engineering records. FCC Rules Section 0.434(e) specifically disclaims the accuracy of its databases, recommending the use of primary data sources (i.e., paper documents), which is not practical for DTV interference analyses. Further, while Hammett & Edison, Inc. endeavors to follow official releases and established precedents on the matter, FCC policy on DTV analysis methods is constantly changing. Thus, the results of OET-69 interference and coverage studies are subject to change and may differ from FCC results.

Station KEZI-DT • as Channel D44 • Eugene, Oregon

OET-69 Coverage Study for KEZI-DT as Channel D44
548 kW (DA) ERP Dielectric C170 Pattern at 190°T
C.O.R. = 742.5 m AMSL



Map data taken from Sectional Aeronautical Charts, published by the National Ocean Survey. Geographic coordinate marks shown at 30-minute increments.

×= No Signal (below threshold)
✱= Interference (with population in cell)
●= Interference (without population in cell)
⊕= Longley-Rice error cell

HAMMETT & EDISON, INC.
CONSULTING ENGINEERS
SAN FRANCISCO

000907
Figure 3B

TVCOVSTUDY™ Analysis Methodology

Implementation of FCC's Interference-Based Algorithm to Predict Coverage

On April 21, 1997, the Federal Communications Commission released its Fifth and Sixth Report and Order texts to Mass Media Docket No. 87-268, establishing a final Table of Allotments for the transition from analog NTSC television service to a digital television ("DTV") service. The Commission utilized a complex set of computerized analysis tools to generate the DTV allotment table and added FCC Rules Section 73.623(b)(2), requiring that similar tools be employed to analyze individual DTV station assignments with regard to their potential interference to other DTV stations, DTV allotments, and existing or authorized NTSC facilities. Those tools were described in FCC OET Bulletin No. 69, *Longley-Rice Methodology for Evaluating TV Coverage and Interference* ("OET-69"), released on July 2, 1997. Subsequent to OET-69, the Commission released, on February 23, 1998, its Memorandum Opinion and Order on Reconsideration of the Fifth [and Sixth] Report and Order[s], which made a number of changes to the previous allotment table and modified several of the analysis methods to be employed for studying DTV allotments and potential facility modifications. On August 10, 1998, the Commission published a text, *Additional Application Processing Guidelines for Digital Television (DTV)*, which provided important clarifications and enhancements to the specified analysis methods. Hammett & Edison has developed and refined the TVCOVSTUDY computer software to perform FCC-style DTV coverage studies as based on OET-69, its subsequent clarifications, and also upon a detailed examination of the FCC allotment program software source code.

For most NTSC or DTV stations to be studied, the FCC analysis model first determines the location of the conventional F(50,50) Grade B contour of the NTSC station, or of the NTSC station associated with an assigned DTV station, using pattern information contained in the FCC engineering database and an assumed antenna elevation pattern. The model assumes that contour as an envelope, outside of which no protection from interference is implied or afforded. The location of the Grade B contour was used to determine the assigned power for the DTV station, once again using conventional methods found in FCC Rules Section 73.699, Figures 9 and 10, determining the power necessary on a radial basis to generate the associated DTV coverage contour (41 dBu for UHF, 36 dBu for high VHF Channels 7–13, and 28 dBu for low VHF Channels 2–6), for an assigned DTV channel. The maximum power determined using this method was assigned as the DTV operating power, provided it was calculated to be above established minimum power levels; otherwise, a minimum power level was assigned. By the same token, facilities with calculated DTV power levels above the established maximum power levels for a given channel were assigned the maximum power level. The use of this method usually creates a directional DTV antenna replication pattern, even for DTV assignments to presently omnidirectional NTSC TV stations. The FCC requires that a DTV facility employ an antenna design that meets the calculated replication envelope parameters, unless, with a few exceptions, zero or *de minimus* new interference to other facilities can be demonstrated.

In addition to the use of the Grade B envelope and an assumed directional transmitting antenna for all DTV facilities, the model assumes the use of directive receiving antennas at each studied location, or "cell." The characteristics of the receiving antennas are different, not only for the low

VHF, high VHF, and UHF frequency bands, but also for NTSC and DTV receiving situations; the FCC model specifies that more directive antennas be employed for analysis of DTV reception.

The FCC analysis technique employs terrain-sensitive calculation methods based on Version 1.2.2 of the ITS Irregular Terrain Model, also known as the Longley-Rice model. For each NTSC or DTV station to be studied, a grid of cells, two kilometers on a side, fills the associated Grade B or noise-limited contour. The program first determines which of the cells is predicted to receive service from the associated station, using Longley-Rice analysis with F(50,50) statistical weighting for NTSC and F(50,90) statistical weighting for DTV stations. Cells determined to have no service are not studied for interference from other stations.* Once cells having service are determined, the software analyzes potential interference from other NTSC or DTV stations, again using the Longley-Rice propagation algorithm and defined statistical weighting for all potential interfering signals. Each cell is evaluated, as appropriate, using the desired-to-undesired ratios and methods presented in FCC Rules Section 73.622, 73.623, and 74.706 for each channel relationship, and cells determined to have interference are flagged and excluded from further study, resulting in the generation of net interference-free coverage population totals.

The TVCOVSTUDY analysis program employs all of the OET-69 analysis features described above, as well as several other more subtle elements prescribed by the FCC. Additionally, the program allows modeling of implementation scenarios that involve changes to effective radiated power, antenna height, antenna pattern, channel number, and/or transmitter location. TVCOVSTUDY also can identify cells that fall in major bodies of water, as based on digitized map data, excluding them from the study. The program is primarily intended to study coverage of DTV or NTSC facilities, as based on desired-to-undesired ratio parameters defined in OET-69. A typical TVCOVSTUDY analysis summary includes technical parameters of the proposed DTV or NTSC facility, along with a listing of each interfering DTV and/or NTSC facility or allotment with associated interference population and area tabulations within the protected area of the proposed facility. TVCOVSTUDY is similar to the program TVIXSTUDY, which instead predicts the interference effects on other stations by a proposed facility.

The results of the OET-69 algorithm are dependent on the use of computer databases, including terrain, population, and FCC engineering records. FCC Rules §0.434(e) specifically disclaims the accuracy of its databases, recommending the use of primary data sources (*i.e.*, paper documents), which is not practical for DTV interference analyses. Further, while Hammett & Edison, Inc. endeavors to follow official releases and established precedents on the matter, FCC policy on DTV analysis methods is constantly changing. Thus, the results of OET-69 interference and coverage studies are subject to change and may differ from FCC results.

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* It is noted that the Longley-Rice model is not always capable of determining, within certain confidence limits, whether a particular cell has service. In such cases, the Longley-Rice algorithm returns an error code; the FCC method for handling such error codes is to assume that the associated cells have interference-free service and, as such, are not further considered. The Hammett & Edison TVIXSTUDY program reports the number of such error cells for a given study and provides the option of generating a map showing their locations, which may be useful for further review using other propagation analysis tools.